

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	F. Farassat)	Group Art Unit Unknown
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Appl. No.	:	Unknown)	
)	
Filed	:	Herewith)	
)	
For	:	MECHANISM FOR)	
		EXCHANGING CHIP-)	
		CARRIER PLATES FOR USE)	
		IN A HYBRID CHIP-)	
		BONDING MACHINE)	
)	
Examiner	:	Unknown)	

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Prior to examination, please amend the above referenced application as follows:

IN THE ABSTRACT:

Please amend the abstract as follows:

Abstract of the Disclosure

A mechanism for exchanging chip-carrier plates in a hybrid chip-bonding machine having a plurality of chip-carrier plates, a magazine to store the plurality of chip-carrier plates, and a transport arrangement having a first and second clamping device that are disposed on a movable holder is disclosed. The transport arrangement is designed to remove a selected chip-carrier plate from the magazine and deliver it to a chip processing station. After processing, the selected chip-carrier plate is removed and deposited in the magazine. Movement of the chip-carrier plates is controlled such that the selected chip-carrier plate is positioned at a collection point to be collected from the magazine. Movement of the transport arrangement holder is controlled such that the first and second clamping devices are disposed in a vertical arrangement

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on the holder and are constructed to individually release or grip a chip-carrier plate in a similar angular position of the holder.

IN THE SPECIFICATION:

Page 1, immediately after the title, please insert:

Related Applications

This application claims the benefit of the European application 01 126 708.5 filed November 8, 2001.

Please amend the paragraph beginning on page 1, line 11, as follows:

Background of the Invention

Field of the Invention

The invention relates to a mechanism for exchanging chip-carrier plates in a hybrid chip-bonding machine, in particular to an automatic hybrid chip-bonding machine.

Description of the Related Art

Please amend the paragraph beginning on page 3, line 16, as follows:

Summary of the Invention

It is the objective of the present invention to disclose an improved mechanism for exchanging chip-carrier plates as well as a method of operating such a mechanism, with which still greater operating efficiency can be attained, and hence lower production costs for chip bonding.

Please amend the paragraph beginning on page 5, line 26, as follows:

Brief Description of the Drawings

A preferred embodiment of a chip-carrier-plate system in accordance with the invention is described in greater detail in the following, with reference to the attached drawings, wherein

Fig. 1 shows a schematic overall view of the components of an automatic hybrid chip-bonding machine;

Please amend the paragraph beginning on page 6, line 3, as follows:

Detailed Description of the Preferred Embodiment

Fig. 1 shows the principles of construction of an automatic hybrid chip-bonding machine 1, which comprises on one hand an epoxy die bonder 2 and on the other hand a die collet system 4 for chip assembly, which are the actual processing stations. The chip-bonding machine 1 further comprises a chip-delivery system 6 and a chip-detaching system 8. The chip-delivery system 6 includes a magazine 10 to contain a plurality of chip-carrier plates as well as the actual delivery mechanism, which is the object of the invention. Chip-bonding machines of this kind have long been known, so that their construction and the interaction of the main components need not be described further here.

IN THE CLAIMS:

Please amend the Claims as follows:

WHAT IS CLAIMED IS:

1. (Amended) A mechanism for exchanging chip-carrier plates for use in a hybrid chip-bonding machine having a chip-detaching system and a common base element, the mechanism comprising:

a plurality of chip-carrier plates;

a magazine to store the plurality of chip-carrier plates;

a transport arrangement having a first and a second clamping device that are disposed on a movable holder in a manner such that the transport arrangement is designed to remove a selected chip-carrier plate from the magazine, deliver the selected chip-carrier plate to a processing station of the chip-detaching system, and after processing remove the selected chip-carrier plate from the processing station and deposit the selected chip-carrier plate in the magazine;

a first controller configured to move the chip-carrier plates within the magazine in a manner such that the selected chip-carrier plate is positioned at a collection point to be collected from the magazine; and

a second controller configured to move the movable holder of the transport arrangement, wherein the first and second clamping devices are disposed one above the other in a vertical arrangement on the holder and are constructed so that each can individually release or grip a chip-carrier plate on one and the same angular position of the holder.

2. (Amended) The mechanism of Claim 1, wherein the first and second clamping devices comprise a receiving element with a pneumatically or electrically actuated clamp for the controllable fixation of a chip-carrier plate or the release thereof.

3. (Amended) The mechanism of Claim 1, wherein the chip-carrier plates are constructed as plates with a substantially square outer shape and engagement bores to engage the clamping devices of the transport arrangement as well as a holding device of the chip-detaching system.

4. (Amended) The mechanism of Claim 1, wherein the chip-carrier plates are designed to receive conventional chip carriers selected from the group consisting of a type of the waffle pack, gel pack, and carrier-film frame.

5. (Amended) The mechanism of Claim 1, wherein the first and second clamping devices are attached to a common base element that can be displaced vertically with respect to a housing of the transport arrangement.

6. (Amended) A method of operating a mechanism for exchanging chip-carrier plates in a hybrid chip-bonding machine, wherein, when a transport arrangement of an exchanging mechanism is in a first working position, comprising the steps of:

removing a selected chip-carrier plate from a magazine immediately followed by a step of

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depositing another chip-carrier plate, which has been taken out of a processing station, in a magazine, and when the transport arrangement is in a second working position,

transferring the chip-carrier plates taken from the magazine into the processing station,

removing the processed chip-carrier plate from the processing station, such that each transport event from the magazine to the processing station and in the reverse direction is carried out while a chip-carrier plate is being handled in the processing station.

7. (Amended) The method of Claim 6, wherein delivering the selected chip-carrier plate to the processing station further includes the step of returning the selected chip-carrier plate from the processing station to the magazine.

8. (Amended) The method of Claim 6, wherein the transport arrangement moves only in a straight line in both directions between the first and second working positions.

Please, add the following new Claims:

9. (New) The method of Claim 6, wherein the steps are performed in the listed order.

10. (New) The method of Claim 6, wherein the steps are performed in the reverse of the listed order.

11. (New) A method of operating a mechanism for exchanging chip-carrier plates in a hybrid chip-bonding machine having a processing station, a magazine, and a transport arrangement in a first working position, the method comprising:

a first transport event, wherein a selected chip-carrier plate is removed from a magazine;

a second transport event, wherein another chip-carrier plate, which has been taken out of the processing station, is deposited in the magazine;

a third transport event, wherein, when the transport arrangement is in a second working position, the chip-carrier plates taken from the magazine are transferred into the processing station; and

a fourth transport event, wherein the processed chip-carrier plate is removed from the processing station.

12. (New) The method according to Claim 11, wherein transferring the selected chip-carrier plate to the processing station includes returning the selected chip-carrier plate from the processing station to the magazine.

13. (New) The method according to Claim 11, wherein the transport arrangement moves only in a straight line in both directions between the first and second working positions.

14. (New) The method of Claim 11, wherein the transport events and are carried out in a reverse order such that each transport event from the magazine to the processing station and in the reverse direction is carried out while at least one of the chip-carrier plates is being handled in the processing station.

15. (New) A mechanism for exchanging chip-carrier plates in a chip-bonding machine having a processing station, the mechanism comprising:

a magazine to store the chip-carrier plates;

a transport arrangement having a first and second clamping device that are disposed on a movable holder such that the transport arrangement is designed to remove a selected chip-carrier plate from the magazine, deliver the selected chip-carrier plate to the processing station, and after processing remove the selected chip-carrier plate from the processing station and deposit the selected chip-carrier plate in the magazine; and

a first control component that is configured to move the holder of the transport arrangement, wherein the first and second clamping devices are disposed one above the other on the holder and are configured in a manner such that each clamping device individually releases or grips at least one of the chip-carrier plates in a position relative to the holder.

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16. (New) The mechanism of Claim 15, wherein the mechanism further comprises a second control component.

17. (New) The mechanism of Claim 16, wherein the second control component is configured to move the at least one of the chip-carrier plates within the magazine in a manner such that the selected chip-carrier plate is positioned at a collection point to be collected from the magazine.

18. (New) The mechanism of Claim 15, wherein the first and second clamping devices comprise a receiving element with an actuated clamp for the controllable fixation or release of at least one of the chip-carrier plates.

19. (New) The mechanism of Claim 18, wherein the actuated clamp is a pneumatically actuated clamp.

20. (New) The mechanism of Claim 18, wherein the actuated clamp is an electrically actuated clamp.

21. (New) The mechanism of Claim 15, wherein the chip-carrier plates are constructed as plates with a substantially square outer shape and engagement device.

22. (New) The mechanism of Claim 21, wherein the engagement device is used by the chip-detaching system as a holding device.

23. (New) The mechanism of Claim 22, wherein the engagement device comprise bores, which are configured to engage the clamping devices of the transport arrangement.

24. (New) The mechanism of Claim 15, wherein the chip-carrier plates are designed to receive conventional chip carriers.

25. (New) The mechanism of Claim 24, wherein the conventional chip-carriers are carrier types selected from the group consisting of a waffle pack, a gel pack, and a carrier-film frame.

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26. (New) The mechanism of Claim 15, wherein the mechanism further comprises a common base element and a transport arrangement housing.

27. (New) The mechanism of Claim 26, wherein the first and second clamping devices are attached to the common base element.

28. (New) The mechanism of Claim 27, wherein the common base element may be displaced vertically with respect to the transport arrangement housing.

29. (New) The mechanism of Claim 15, wherein the chip-bonding machine is a hybrid chip-bonding machine.

30. (New) The mechanism of Claim 15, wherein the mechanism further comprises a chip-detaching system.

31. (New) The mechanism of Claim 30, wherein the chip-detaching system comprises the processing station.

32. (New) The mechanism of Claim 15, wherein the first and second clamping devices are disposed one above the other in a vertical arrangement on the holder.

33. (New) The mechanism of Claim 15, wherein the first and second clamping devices are configured so that each clamping device individually releases or grips a chip-carrier plate in a substantially similar position relative to the holder.

34. (New) The mechanism of Claim 33, wherein the position includes an angular position.

REMARKS

These changes are being made to bring the subject application into better conformance with U.S. practice, to claim the benefit of a previously filed European application, and to more distinctly claim what the Applicant regards as the invention. No new matter is being introduced. Entrance of this amendment is respectfully requested.

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Attached hereto is a marked-up version of the changes made to the application by the current amendment captioned "**Version with Markings to Show Changes Made**"; additions are shown as underlined and deletions are shown [bracketed].

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 2/18/02

By: 

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Version with Markings to Show Changes Made

IN THE ABSTRACT:

The Abstract has been amended as follows:

[Mechanism] A mechanism for exchanging chip-carrier plates[, in particular for use] in a hybrid chip-bonding machine [(1), with:] having a plurality of chip-carrier plates [(12)], a magazine [(10)] to store the plurality of chip-carrier plates [(12)], and a transport arrangement [(40) comprising] having a first and second clamping device [(42, 44)] that are disposed on a movable holder [(46), such that] is disclosed. The [the] transport arrangement is designed to remove a selected chip-carrier plate from the magazine[,] and deliver it to a chip processing station[,]. After processing, the selected chip-carrier plate is removed and deposited in the magazine. Movement of [in particular a chip-detaching system (8), of the chip-bonding machine, and after processing remove it from the processing station and deposit it in the magazine, a control means to move] the chip-carrier plates [within the magazine in such a way] is controlled such that the selected chip-carrier plate is positioned at a collection point to be collected from the magazine[,]. Movement of the transport arrangement holder is controlled such that [and a control means to move the holder of the transport arrangement, wherein] the first and second clamping devices [(42, 44)] are disposed [one above the other, in particular] in a vertical arrangement[,] on the holder [(46)] and are constructed [so that each can] to individually release or grip a chip-carrier plate in [one and the same] a similar angular position of the holder.

[(Fig. 1)]

IN THE SPECIFICATION:

Page 1, immediately after the title, please insert:

Related Applications

This application claims the benefit of the European application 01 126 708.5 filed November 8, 2001.

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Please amend the paragraph beginning on page 1, line 11, as follows:

[DESCRIPTION]

Background of the Invention

Field of the Invention

The invention relates to a mechanism for exchanging chip-carrier plates in a hybrid chip-bonding machine, in particular to an automatic hybrid chip-bonding machine[, according to the precharacterizing clause of Claim 1].

Description of the Related Art

Please amend the paragraph beginning on page 3, line 16, as follows:

Summary of the Invention

It is the objective of the present invention to disclose an improved mechanism for exchanging chip-carrier plates as well as a method of operating such a mechanism, with which still greater operating efficiency can be attained, and hence lower production costs for chip bonding.

Please amend the paragraph beginning on page 5, line 26, as follows:

Brief Description of the Drawings

A preferred embodiment of a chip-carrier-plate system in accordance with the invention is described in greater detail in the following, with reference to the attached drawings, wherein

Fig. 1 shows a schematic overall view of the [most important] components of an automatic hybrid chip-bonding machine;

Please amend the paragraph beginning on page 6, line 1, as follows:

Detailed Description of the Preferred Embodiment

Fig. 1 shows the principles of construction of an automatic hybrid chip-bonding machine 1, which comprises on one hand an epoxy die bonder 2 and on the other hand a die collet system 4 for chip assembly, which are the actual processing stations. The chip-bonding machine 1

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further comprises a chip-delivery system 6 and a chip-detaching system 8. The chip-delivery system 6 includes a magazine 10 to contain a plurality of chip-carrier plates as well as the actual delivery mechanism, which is the object of the invention. Chip-bonding machines of this kind have long been known, so that their construction and the interaction of the main components need not be described further here.

IN THE CLAIMS:

The claims have been amended as follows:

WHAT IS CLAIMED IS:

1. (Amended) A mechanism [Mechanism] for exchanging chip-carrier plates, [in particular] for use in a hybrid chip-bonding machine [(1), with] having a chip-detaching system and a common base element, the mechanism comprising:

- [-] a plurality of chip-carrier plates [(12),];
- [-] a magazine [(10)] to store the plurality of chip-carrier plates [(12),];
- [-] a transport arrangement [(40) comprising] having a first and a second clamping device [(42, 44)] that are disposed on a movable holder [(46),] in a manner such that the transport arrangement is designed to remove a selected chip-carrier plate from the magazine, deliver [it] the selected chip-carrier plate to a processing station[, in particular a] of the chip-detaching system [(8), of the chip-bonding machine], and after processing remove [it] the selected chip-carrier plate from the processing station and deposit [it] the selected chip-carrier plate in the magazine[,];
- [-] a [control means] first controller configured to move the chip-carrier plates within the magazine in a manner such [a way] that the selected chip-carrier plate is positioned at a collection point to be collected from the magazine[,]; and
- [-] a [control means] second controller configured to move the movable holder of the transport arrangement wherein, [characterized in that] the first and second clamping devices [(42, 44)] are disposed one above the other[, in particular] in a vertical arrangement[, on the holder [(46)]] and are constructed so that each can individually release or grip a chip-carrier plate on one and the same angular position of the holder.

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2. (Amended) The mechanism of Claim 1, wherein the [Mechanism for exchanging chip-carrier plates according to Claim 1,

characterized in that each of the] first and second clamping devices [(42, 44)] comprise[s] a receiving element [(48)] with a pneumatically or electrically actuated clamp [(50, 52)] for the controllable fixation of a chip-carrier plate [(12)] or the release thereof.

3. (Amended) The mechanism of Claim 1, wherein [Mechanism for exchanging chip-carrier plates according to Claim 1,

characterized in that] the chip-carrier plates [(12)] are constructed as plates [(12.1)] with a substantially square outer shape and engagement [means, in particular] bores [(12.6, 12.7),] to engage the clamping devices of the transport arrangement as well as a holding [means] device of the chip-detaching system.

4. (Amended) The mechanism of Claim 1, wherein [Mechanism for exchanging chip-carrier plates according to claim 1,

characterized in that] the chip-carrier plates [(12)] are designed to receive [all] conventional chip carriers[, in particular of the] selected from the group consisting of a type of the waffle pack, gel pack [or] and carrier-film frame.

5. (Amended) The mechanism of Claim 1, wherein [Mechanism for exchanging chip-carrier plates according to claim 1,

characterized in that] the first and second clamping devices [(43, 44)] are attached to a common base element [(54)] that can be displaced vertically with respect to a housing [(56)] of the transport arrangement [(40)].

6. (Amended) A method [Method] of operating [the] a mechanism for exchanging chip-carrier plates in a hybrid chip-bonding machine, wherein, [in particular according to one of the preceding claims, characterized in that] when a transport arrangement of [the] an exchanging mechanism is in a first working position, [a step in which] comprising the steps of:

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removing a selected chip-carrier plate [is removed] from a magazine [is] immediately followed by a step of [in which]

depositing another chip-carrier plate, which has been taken out of a processing station, [is deposited] in [the] a magazine, and when the transport arrangement is in [another] a second working position,

[a step in which] transferring the chip-carrier plates taken from the magazine [are transferred] into the processing station,

[as well as a step in which] removing the processed chip-carrier plate [is removed] from the processing station, [are carried out in this or the reverse order,] such that each transport event from the magazine to the processing station and in the reverse direction is carried out while a chip-carrier plate is being handled in the processing station.

7. (Amended) The method of [Method according to] Claim 6, wherein delivering the [characterized in that each transport event serves both to deliver a] selected chip-carrier plate to the processing station [and to return] further includes the step of returning a chip-carrier plate from the processing station to the magazine.

8. (Amended) The method of [Method according to] Claim 6, wherein [characterized in that] the transport arrangement moves only in a straight line in both directions between the first and second working positions.